Pronunciations of carnivorous plant genera:

Sarracenia (sĕr-ă-sē-nĭ-ă)
Darlingtonia (dăr-lĭng-tō-nĭ-ă)
Heliamphora (hē-lĭ-ăm-fōr-ă)
Nepenthes (nē-pĕn-thēz)
Cephalotus (sĕf-ă-lō-tŭs)
Dionaea (dī-ō-nē-ă)
Aldrovanda (ăl-drō-văn-dă)
Drosera (drŏs-ĕr-ă)
Drosophyllum (drŏs-ō-fĭl-ŭm)
Byblis (bĭb-lĭs)
Pinguicula (pĭn-gwĭck-ū-lă)
Utricularia (ū-trĭk-ū-lā-rĭ-ă)
Polypompholyx (pŏly-pŏm-fō-lĭcks)
Genlisea (gĕn-lĭ-sĭ-ă)

References cited:

Cronquist, Arthur. 1968. The Evolution and Classification of Flowering Plants. Houghton Mifflin Co., Boston. 396 pp.

Lloyd, F. E. 1942. The Carnivorous Plants. Chronica Botanica Co. Reprinted 1976 by Dover Publications. 352 pp.

Shetler, S. G. 1972. Carnivorous Plants, pp. 938-939. *In* Encyclopedia Britanica, Vol. 4.

Ziemer, R. & J. Mazrimas. 1974. World Carnivorous Plant list. Carnivorous Plant Newsletter, Spec. Proj. Suppl. 1.

Next in the Botanists Corner we will begin a series on the discovery of the various CP genera, and the derivation and meanings of their scientific and common names.

Review of Recent Literature

Colombo, P. M., Rascio, N. Ruthenium red staining for electron microscopy plant material. J. Ultrastruct. Res. 60(2): 135-139 (1977).

Drosera spathulata mucilage was intensely stained using ruthenium red in glutaraldehyde and osmium tetroxide as seen by the electron microscope.

Dzwonko, A., Plazinska, J. Decline of selected water plants in the vicinity of Krakow during the last 150 years. Zesz. Nauk. Uniw. Jagiellonsk. Pr. Bot. 5, 134-148. 1977. In Polish with English summary.

Aldrovanda vesiculosa is one of the species of extinct plants from the Oxbow lakes of the Vistula River near Krakow, Poland. The authors discuss the causes of this and some conservation measures.

Folkerts, George W. 1977. Endangered and threatened Carnivorous Plants of North America. pp. 301-303 *In* Chillean T. Prance & T. S. Elias, editors. Extinction is Forever: Threatened and Endangered species of plants in the Americas and their significance in ecosystems today and in the future. New York Botanical Garden, New York. [Folkerts' address for reprints: Dept. of Zoology-Entomology, Auburn University, Auburn, Alabama 36830.]

Brief discussion of each species of CP (or genus for larger groups) and its status as an endangered plant. All species of *Sarracenia* and *Darlingtonia* are discussed. Of these, *S. oreophila* and *S. alabamensis* ssp. *wherryi* (= *S. rubra* ssp. *wherryi*) are considered by the author to be threatened; while *S. alabamensis* ssp. *alabamensis* (= *S. rubra* ssp. *alabamensis*) and *S. jonesii* (= *S. rubra* ssp. *jonesii*) are considered to be endangered. ENDANGERED implies that a species is on the verge of becoming extinct unless measures are taken to preserve it. THREATENED means that the numbers of species or populations are critically low so that the species is

likely to soon become endangered. *S. rubra* ssp. *rubra* is not considered to belong on an endangered threatened list. While *Dionaea* is considered threatened, due mainly to habitat destruction and purported over-collecting, it is far from endangered. No *Drosera* are considered threatened or endangered.

Because of the inconspicuous nature of many *Utricularia* species, it is difficult to know the status of each species. None are considered threatened or endangered. In the genus *Pinguicula, P. ionantha* is considered to be threatened. *P. planifolia* is mentioned as being included on the Smithsonian E & T Plant List, but the present author considers it unnecessary to include it on such list. Finally, the article discusses factors affecting the survival of the southeastern US Carnivorous Plants, which are: Lumbering, agricultural drainage, farm pond construction, reduction of fire and ecological succession, over-collecting and introgressive hybridization. As always, he concludes by emphasizing that the only way to preserve species is to preserve appropriate habitats in which they occur and to understand proper management. He disagrees totally with the idea that because a great deal of cultivated material exists, that we no longer need to worry about wild populations.

Hardin, James W. 1977. "Vascular Plants," pp. 56-142.
In J. E. Cooper, *et al.* (editors) Endangered and Threatened Plants and Animals of North Carolina: Proceeding of a Symposium. N.C. State Museum of Natural History, Raleigh.
"This publication [available below as a reprint] includes a discussion of the concept of rarity, status categories, and the rationale for the priorities assigned to them. The 410 rare species of native vascular plants in North Carolina are listed and their status indicated. The 91 species considered of greatest concern are described briefly, and information given on distribution, habitat, status, and important references. Over half of the 91 species are illustrated with line drawings.
"This information on endangered and threatened plants is designed to help biologists, resource managers, teachers, conservationists, and the general public become better informed regarding the general concept and terminology pertaining to endangered species."
Of the 91 plants of greatest concern, are listed *Dionaea*, and *Sarracenia rubra* (ssp. *rubra*). In addition, *Drosera filiformis* is listed as endangered in N.C.; and *Utricularia geminiscapa* is listed as endangered in N.C.
Reprints of this Chapter on *PLANTS* is available for $2.50 (includes postage) from: Bookstore, University of North Carolina at Charlotte, UNCC Station, Charlotte, N.C. 28223.

Heslop-Harison, Y. 1978. Carnivorous Plants. Scientific American. Feb., 104-115.
An excellent review of the CP glandular anatomy and physiology of the digestive glands with emphasis and scanning electron micrographs on *Pinguicula*. A table with the known enzymes detected for each genus is given.

Kologiski, Russell L. 1977. The Phytosociology of the Green Swamp, North Carolina. Technical Bulletin No. 250, North Carolina Agriculture Experiment Station.
[Kologiski's current address: U.S. Fish and Wildlife Service, Northern Prarie Wildlife Research Center, Jamestown, North Dakota.]
"This report is a description of the vegetation and habitat of one of the most biologically unique natural areas in North Carolina. Much of the study area is characterized by organic soils, long hydroperiods [standing water], frequent

fires, and a dense, semi-evergreen, shrubby vegetation type known as pocosin. The area achieved national recognition when in May 1974 the Secretary of the Interior designated the Green Swamp as a Natural Landmark as prescribed by the National Park Service. In July 1977, approximately half the study area (13,850 acres) was deeded to the Nature Conservancy by the Federal Board Co., Inc. It is hoped that this study will aid in the preservation and management of this and similar habitats and, also, give rise to future research aimed at understanding the complexities of this habitat type."

Of course, the Green Swamp contains the largest no. of CP genera growing together of anywhere in the world: *Dionaea, Drosera, Utricularia, Pinguicula,* and 4 species of *Sarracenia.* While CP *per se* are not discussed in the report, they are mentioned as species occurring in specific habitats, and the description of the habitats and the general area are worth the reading and understanding of this report.

Lindquist, John Arthur. 1975. "Bacteriological and ecological observations on the northern pitcher plant, *Sarracenia purpurea* L." Masters Thesis, University of Wisconsin, Madison. x + 215 pp.

Studies were made on the purple pitcher plant in the lab and in the field (in bogs near Cambridge and Drummond, Wisconsin) to determine what types of bacteria are found in the pitcher fluid and their relation to the digestive action of the fluid. The pH of the fluid in the field varied from 3.1 to 7.2, and carbon dioxide was considered important in maintaining the acidity. The microbial flora of the pitcher fluid were generally typical for plant and aquatic habitats. Proteolytic and chitinolytic bacteria were isolated. The digestion of insects appeared to be largely mediated by the bacteria. This study resulted in an extensive list of isolated bacteria and their biochemical properties. The micro-habitat of the pitcher fluid is a very complex mixture of chemicals and reactions. The thesis also contained an excellent survey of previous work on digestion in the genus *Sarracenia.*

McCollum, Jerry L. & D. E. Ettman, Georgia's Protected Plants. [Available from Resource Planning Section, OPR, Endangered Plant Program, Room 702, 270 Washington Street SW, Atlanta, Georgia 30334. No price is mentioned.]

This is a very nice booklet (64 pages printed one side only(along the lines of the North Carolina Rare Plants publication mentioned above. 58 species are listed, with detailed information on their distribution (a map for each), their status (whether rare, threatened, endangered, etc.), and a drawing is provided for each. In adition, there is a page of color photos, one of which is *Sarracenia minor.* The CP listed are *Sarracenia flava* (threatened), *S. leucophylla* (threatened), *S. minor* (threatened), *S. psittacina* (threatened), *S. purpurea* (endangered), and *S. rubra* (endangered).

Mandossian, A. J. 1966. Germination of seeds in *Sarracenia purpurea.* Mich. Bot. 5:67-79.

Summary: Dormancy of *Sarracenia purpurea* seeds was broken by pre-chilling to 50°F. Treatment by sulphuric acid injured embryo. The substrate (sphagnum, marl, blotter) had no appreciable effect on germination.

Peak germination in the shortest possible time (9-15 days) was achieved in constant light at 28°C, with 1-3 month prechiling, in moist agent.

In absence of pre-chilling, there was practically no germination over any substrate, with any moistening agent, ex-

cept in alternating light and dark in alternating temperature (light at 22°C, 8 hrs. and darkness at 5°C, 16 hours), in which case germination required 39 days.

Factors were discused which might attribute to the lack of seedlings in a given locality.

Mandossian, Adrienne J. 1965. Plant associates of *Sarracenia purpurea* (pitcher plant) in acid and alkaline habitats. Michigan Botanist 4: 107-114.

"It would appear from the study of these five bogs of central lower Michigan that *Sarracenia purpurea* grows over a variety of substrates (semi-aquatic, soft organic soil, and hard marl [lime]), over a pH range of 5.2 to 8.9, that it forms no consistent association with any single plant species, and that within the range examined its reproductive vigor is not determined by the reaction [pH] of the substrate.

Mandossian, A. J. 1966. Variations in the leaf of *Sarracenia purpurea*. Mich. Bot. 5:26-35.

"In view of the above observations it seems reasonable to conclude that for *Sarracenia purpurea* which lives mainly in open sunny places, light intensity is an important factor in normal development of its leaf form, and that low intensity of illumination is a major cause for the production of flattened leaves."

Small, J. G. C., Onraet, A., Grierson, D. S. and Reynolds, G. Studies on insect-free growth, development and nitrate-assimilating enzymes of *Drosera aliciae* Hamet. New Phytologist 79 (1):127-134 (1977).

The above *Drosera* species grown from seed showed better growth with ammonium chloride and ammonium nitrate than with sodium nitrate. The sodium nitrate plants grew better at pH of 4.0 while the plants grown on the ammonium salts grew better at higher pHs. Plants that were grown on a nitrogen-free medium were fed cheese and were little affected by increasing pH. Flowers and seed were produced by all the plants on any of the treatments. The following enzymes were demonstrated in the roots and leaves of control and treated plants: nitrate and nitrate reductase, peroxidase, glutamate dehydrogenase, glutamate synthase and glutamine synthetase.

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Shimizu	The Mystery of Carnivorous Plants	54	$3.75
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———	Aldrovanda vesiculosa at Hanyu-City	32	5.50
Kondo	Carnivorous Plants	292	8.75
Kurata, S.	Nepenthes of Mt. Kinabalu (Eng.)	80	5.00
Asashi	Plants of the World #9 *(Utricularia)*, #46 *(Cephalotus)*, #64 *(Drosera, Nepenthes, Sarracenia)*		2.25 ea.
	Garden Life, Vol. 7, 1977 (Magazine)		4.40